VEGETATION MANAGEMENT PLAN

For

Amtrak

For Railroad Rights-of-Way
In the State of Connecticut

Introduction

Notification

Connecticut law Statue Section 22a-66a (j) requires that railroads who operate in Connecticut and apply pesticides to their rights of way must file a Vegetation Management Plan (VMP) with the Department Of Transportation on or before February 1 of each year and must send copies of the plan to the chief elected official of each town in which pesticides will be applied.

Railroads Operating Under This Plan

The railroad companies listed here have agreed to use this Vegetation Management Plan (VMP):

Amtrak

Purpose of this VMP

This VMP describes a variety of operational practices which include physical, chemical, and other methods used to manage, control and eradicate vegetation on railroad ROW. This VMP outlines and interprets a long-term program for managing vegetation on railroad ROW. This document represents careful planning and collaboration between qualified professionals so that the general welfare and safety of railroad personnel/employees and the public are ensured, and that no unreasonable effects are caused to the environment.

The VMP addresses the major components of vegetation management including: an overview of vegetation management along a railroad ROW; the vegetation management requirements of railroad ROW; the principles of IVM and vegetation management techniques; the protection of sensitive areas and the operational guidelines for herbicide applicators.

Understanding the design of a rail bed and how vegetation influences its structure is critical to understanding the management practices necessary for maintaining a safe rail line.

Components of the Railbed

(See Appendix A for diagram)

The typical railroad roadbed consists of ballast on a graded and compacted earthwork section. The track is supported by the ballast. The earthwork section typically slopes downward to drainage ditches on each side of the track.

The entire railroad roadbed and adjacent area are designed to carry water away from the tracks. The ballast is the material between and under the ties. It consists of crushed stone or gravel and is compacted around and under the ties to support them vertically and laterally. Pore space in the ballast allows water to drain away from the ties and into drainage ditches which carry it away from the track. Dirt falling from passing trains or washed or blown into the ballast can inhibit drainage and can provide adequate seedbed areas for some plants.

How Vegetation May Affect the Integrity of the Railbed

Plant seeds carried to the track area by the same mechanisms as the dirt can sprout and begin to develop. During plant development, fibrous root systems appear which expand through the ballast and accumulate additional dirt. The fibrous roots of most plants are continuously dying and renewing themselves adding decaying plant material to the accumulating dirt. This mixture of dirt and plant material holds moisture and provides a seedbed for new plants. The drainage capacity of the ballast is greatly reduced and moisture is retained around the ties contributing to their decay.

During rain, the fouled ballast can retain enough moisture to become saturated. This results in a loss of support for the track both vertically and laterally leading to movement under the train.

Vegetation and Fire Hazards

In dry weather, vegetation within the roadbed can be easily set on fire by brake shoes on steel wheels. The exhaust from diesel locomotives is another source of sparks, particularly as the throttle position is being increased or decreased. Track maintenance activities such as cutting, grinding, or welding rail are another ignition source. In order to minimize the potential for fires, railroads keep their ROW clear of flammable material, including vegetation.

Other Safety Issues that May Result from the Presence of Vegetation in the Ballast Area

An additional problem occurs with the above ground portion of plants growing near the rails. Trains depend on friction between the steel rails and steel wheels for moving and braking. Anything that reduces friction between the wheels and rails can create dangerous problems. A light rain which wets the track can double or triple minimum stopping distances required, depending on the train's weight, speed, and the slope involved. Most plant tissues are immediately crushed between the wheel and rail, but release water and plant sap which acts as a lubricant just as rain does and may increase stopping distance by the same proportions.

Vegetation also creates unsafe footing for railroad personnel/employees, particularly train crews which may be at work at any hour and in any weather. The vegetation itself may be the hazard or it may conceal objects or areas of unsafe footing.

Vegetation, Visibility, and Signals

Visibility is important both for railroad personnel working on or near trains and for motorists crossing railroad tracks. Train engineers and other operating personnel must be able to see all types of railroad signals. These signals indicate the status of the traffic on the track ahead and also indicate when whistles must be sounded as the train approaches a road crossing. Signs also provide other types of safety information as well. Motorists must be able to see trains as they approach railroad crossings and employees must be able to visually inspect moving rail equipment. Locomotive engineers must be able to see around curves and see that switches and derails are in the correct position.

Federal laws require vegetation control to ensure proper functioning of signals and communication lines. Trees and plants short out electrical equipment and cause failure of communication systems and signals.

Inspections and Vegetation Management

Vegetation in and around the rails and ties must be managed in order to permit routine inspections of the roadbed structural integrity. Vegetation that hinders the ability to inspect roadbed structures must be eliminated in order to ensure the safety of railroad personnel and operations.

Adopting an Integrated Vegetation Management Approach

Integrated Vegetation Management, as performed by the railroads, involves careful planning, organizing, and implementing an overall program involving all operational departments and personnel, so that all appropriate techniques of vegetation control will be considered.

All appropriate non-chemical techniques and methods which remove or control pest vegetation will be identified and integrated into the overall vegetation management program. No sector or area of the ROW will receive herbicide treatment if a routine or operational activity will remove the vegetation during the process. This operational procedure is intended to further reduce the reliance on chemical control and the amount of herbicide applied each year.

Whenever possible and wherever consistent with the ROW system, the railroad industry should implement an integrated approach to vegetation management by encouraging plant communities which hinder the development of target vegetation.

Ensuring the IVM Approach is Successful

A team of professionals comprised of road masters, engineers of track and vegetation control, and herbicide application specialists will develop an annual plan that select those vegetation control methods which minimize risk to personnel and operator, for the general public and the environment. The railroads will monitor and evaluate the success of their program and integrate appropriate new methods in their VMP.

Federal Railroad Administration (FRA) Regulations

FRA regulations (49 CFR Part 213.37) require that vegetation be controlled so as not to interfere with the track inspector's duties. Specifically 49 C.F.R. Subsection 213.37 states:

Vegetation on railroad property which is on or immediately adjacent to roadbed must be controlled so that it does not:

(a) Become a fire hazard to track carrying structures
(b) Obstruct visibility of railroad signs and signals
(c) Interfere with railroad personnel/employees performing normal trackside duties
(d) Prevent proper functioning of signal and communication lines
(e) Prevent railroad personnel/employees from visually inspecting moving equipment from their normal duty stations

Annual vegetation control is necessary in the following areas:

- Ballast section
- Ballast shoulder

- Yards
- Switches, signals, and signs
- Highway grade crossings
- Bridges, bridge abutments, and buildings
- Off-track areas
- Inside of curves

The statutory and regulatory intent is specific: the safety of the railroad must be guaranteed through inspection, maintenance, and repair of the ROW.

Meeting FRA Requirements

In areas such as those adjacent to the ROW roadbed where total vegetation control is not required, various selective vegetation control techniques are practiced. The goal and purpose of this integrated vegetation control approach is to increase competition for light and growing space for desirable species by selectively eliminating tree species.

By selectively removing these target species by physical or chemical methods, the non-target species will not be affected. In these cases, the target vegetation is eliminated and the desirable, low growing species will be able to rapidly grow and fill the area due to an increase in sunlight, water, and nutrients.

The selective elimination of trees and brush species is site, species, and density dependent. The selection of technique will also take into consideration the preservation and enhancement of non-target desirable species. In no case would a pre-emergent herbicide be used in these areas.

In certain adjacent areas of the ROW, branches and limbs of trees grow into or have the potential to move into the roadbed area striking trains or fouling overhead communication lines. In these cases, the tree will not be eliminated if a selective side trimming of the encroaching limbs can be made from an aerial lift mounted on hi-rail equipment, or on a truck.

Selective side trimming will be considered on a site by site basis according to the type and density of target vegetation present and its propensity to invade the roadbed area or foul communication lines.

Trees and shrubs on the ROW which act as a buffer between the adjacent property and ROW will only be managed if they will interfere with the function and safety of the ROW. Selective vegetation management increases desirable vegetation, prevents erosion, and is aesthetically pleasing to adjacent property owners.

In summation, this VMP can also be considered an integrated plant management program. The ROW will be subject to monitoring the vegetation on the roadbed and adjacent areas. On those areas, in which the vegetation will not be controlled by operational activities, an assessment will be performed to determine the most selective vegetation management approach.

General Definition of IVM

IVM is a sustainable approach to managing vegetation by using all appropriate technology and management practices in a way that minimizes health, environmental, and economic risks. IVM includes, but is not limited to: monitoring plant populations; education; structural maintenance and physical, mechanical, and chemical controls.

Components of IVM:

Timing

Timing is the consideration given to applying a treatment action during the most vulnerable time in the life cycle of the vegetation or pest with the least impact on natural predators or other non-target organisms.

Monitoring

Railroad ROW must be monitored (inspected) on a regular basis for integrity of the track and the condition of vegetation in the ROW. This process involves regular inspections under stringent federal guidelines. These inspections take place several times a week, and more frequently during periods of extreme weather. Records of each visit must be kept. If vegetation is present in the track structure or obstructing lines of sight, this must be noted in the Track Inspection and a course of action must be formulated to address control of the vegetation. Weeds or grass gradually invading or germinating in a track area can be monitored during inspection periods.

Evaluation

Evaluation involves analysis of treatment strategies and prescriptions to help determine the effectiveness of the control program. These records are useful in developing future pest management plans.

Railroad Related Terms

Culverts

Culverts are generally constructed with steel pipe, concrete pipe or stone and are normally placed at right angles to the track. Culverts which are not of sufficient length to extend beyond the roadbed spray pattern plus required buffer, or which are shallow to the roadbed and constructed of stone and could allow herbicide to enter a watercourse, will not be treated.

Ditches

Drainage ditches must be maintained so that their function is not impaired. Drainage ditches much be maintained weed-free if necessary to permit the flow of water away from the ballast and track structure and to maintain a stable roadbed.

Railbed

The *rail bed* is a man-made structure which consists of the rail and ties, ballast, ballast shoulder, and its drainage system. The ballast and ballast shoulder are constructed of hard stone which supports the track. It distributes the load on the track evenly and drains water away from the roadbed. The roadbed drainage system is constructed to carry water draining out of the ballast away from the track.

Railroad Yards

Railroad yards include yards, buildings, fueling facilities and off-track areas. Yards are areas with multiple tracks and switches where trains are assembled, disassembled, and equipment is stored. Buildings include offices, maintenance and repair buildings and signal towers, usually within yards.

Fueling areas are locations where locomotive fuel is stored and distributed. Off-track areas are locations that are not assessable from rail.

ROW Area Adjacent to the Shoulder

Trees and shrubs growing adjacent to the shoulder should be managed to promote the growth of low growing shrubs. Treated trees and shrubs will be those which have the potential to block visibility or invade the roadbed and/or overhead communication lines.

The diagram in Appendix A illustrates typical areas on the ROW area adjacent to the shoulder. These areas are generally between the roadbed and the edges of the ROW on either side. Shrubs in these areas provide a visual screen blocking the view of railroad traffic. These areas may be maintained to include a wide variety of shrubs and herbaceous plants.

On the side of the ROW containing overhead signal and communication lines, low growing shrubs and most herbaceous plants will be maintained and encouraged in an effort to reduce the invasion of tall growing trees into these areas. Tall growing trees growing near overheard signal and communication lines must be controlled.

Low growing vegetation will be encouraged in areas containing underground communication or signal lines. In areas where above ground lines are present, low growing vegetation will be encouraged on the area opposite the lines

Sensitive Areas

Sensitive Areas are sites where environmental or anthropogenic features occur adjacent to the ROW that require additional consideration in order to provide protection from ROW vegetation management activities. Sensitive areas may include surface waters, public and private drinking water supplies, threatened and endangered species, and areas with a high level of human activity. Herbicides shall not enter the waters of the State.

Treatment/Vegetation Management Related Terms:

Physical (Mechanical) Control Methods

Physical (Mechanical) Control Methods that manage vegetation through mechanical or physical means, generally are methods restricted to shrub species. Only trees that interfere with the ROW will be targeted. Currently, mechanical methods are not effective in controlling vegetation within the ballast area.

Mowing: the mechanical process of cutting vegetation, including brush, trees and shrubs, with cutting heads. Mowing includes mechanical vegetation and brush cutting with rotary cutting heads. The cutting heads may be mounted on hydraulic arms that greatly extend the lateral reach of the equipment. These machines can be mounted on off-track, on-track, or hi-rail equipment. Large machines are required for railroad application because of the wide range of conditions found on the ROW.

On-track equipment has the advantage of not having to operate over rough terrain. Off-track equipment can work independently of train movement but production may be limited by the difficulty of moving over rough terrain. Off-track equipment also has the advantage of being able to operate under communication and signal lines.

Railroad safety guidelines may restrict the use of brush cutters within developed or recreational areas. Cutting can be accomplished using chain saws, axes, and other hand tools; however, most railroad cutting is done using rotary-type hydraulic cutting equipment. In certain no-spray and buffer zones, target vegetation may be removed by manual cutting by a ground crew. Practicality prevents the entire adjacent area from being managed with this technique based on the following limitations. Lack of skilled woodsmen, prohibitive costs, inaccessible areas, and time requirements are just a few of the factors which prevent the railroad from fully utilizing this technique.

Manual removal or mowing of the ballast area is not feasible because of logistic problems and inefficient vegetation control. Cutting heads are too large to fit between or near the rails and can turn stone ballast into projectiles. As discussed earlier, plants growing in the ballast quickly produce roots that prevent the flow of water away from the track area. Mechanical cutting of vegetation in the ballast area would only remove the plant tops. The roots would be left to re-sprout or if killed, will continue to decay, accumulate additional dirt, and hold moisture. Cutting also allows the upper portion of the plant to decay on the site and add to the growing seedbed litter between the stones.

Brush Cutting (Machine): The process of cutting trees and brush along the railroad ROW with the use of hydraulic cutting heads on rail mounted machines. These machines are designed to cut along the outside of the ballast area and out along the ROW to clear trees and brush from interfering with the safe passage of trains and equipment, and to prevent hampered visualization.

Brush Cutting (Manually): Manual labor using chain saws and axes to cut trees and brush away from the railroad road bed where developments, recreation fields and obstacles are in close proximity to the road bed where using track mounted brush cutting machines would be a hazard to the public.

Chemical Control Methods:
Chemical Control Methods that include the use of herbicides to manage, control, or eradicate unwanted, targeted vegetation. The categories include:

Pre-emergent Herbicide Program: A program directed primarily to the yards, and incorporates IVM strategies to minimize the amount of herbicide used. The scheduling of a main line or yard track section for a pre-emergent herbicide application will depend on a review of the previous years vegetation density and control efforts and an estimate of vegetation density for the upcoming season.

Pre-emergent herbicide applications within the yards may be accomplished from a hi-rail spray truck. This on-track vehicle has the advantage of not having to operate over rough terrain. These hi-rail trucks have a rear mounted boom located approximately 18 inches above the ground.(See Appendix B)

Pre-emergent herbicide applications along the rail bed will be made no more frequently than biannually unless conditions warrant rescue treatment which will be based on vegetation density reports.

Post-emergent Herbicide Program: A program directed primarily toward vegetation management on the railroad ROW main lines and branch lines. These areas comprise the bulk of railroad's ROW and accordingly, account for the greatest proportion of herbicide use.

Pesticide Minimization

All ROW spraying must be done by certified applicators or by persons working under the direct Supervision of a certified applicator. All herbicide applications should be done in a manner and under weather conditions that: (1) minimize the extent and duration of foliar brownout and (2) prevent herbicides from entering areas outside of the ROW.

Labels/MSDS/EPA Fact Sheets

All applications must be accompanied by current labels and Material Safety Data Sheets (MSDS) for each pesticide formulation. These can be obtained through either the manufacturer or distributor of the pesticide formulation. Current EPA Fact Sheets applicable to the active ingredient(s) found in each pesticide formulation must accompany each application when available (when one exists).

Preparation for Herbicide Application

1. Basic Requirements

   To protect the public welfare and eliminate adverse impacts on the environment, railroad herbicide application crews must have a Supervisor and operator who is licensed and certified in the State of Connecticut. Applicators must also have a licensed and certified Supervisor who reports daily to the railroad representative or other qualified railroad personnel/employee who is assigned to this task. The railroad is responsible for adherence to this VMP by railroad personnel/employees or their contractor. Applicators must follow all railroad safety regulations and all herbicide label directions.

   Daily Field Report of Vegetation Control Activities

   The daily field report of Vegetation control activities will be filled out each day by operators doing the work. The daily field report will include, but not be limited to:

   - Date
   - Vehicle and Equipment Numbers
   - Track Name, Number, and Designation

   - Weather

   - Wind Velocity at time 6am 9am 12noon 3pm 6pm
   - Wind direction at time 6am 9am 12noon 3pm 6pm
   - Temperature at time 6am 9am 12noon 3pm 6pm
   - Rain (in inches) at time 6am 9am 12noon 3pm 6pm

   - Acres Treated

   - Roadbed Area
   - Area Adjacent to the Shoulder
   - Mainline
   - Sidings
   - Branch
   - Industrial Track
   - Bridge

- Crossings
- Daily Summary

- Beginning Time
- Ending Time
- Hours Treating
- Total Hours Reported

- Contractor Person on Job (list each individual)
- Railroad Person on Job (list each individual)
- Daily Summary of Chemicals Applied

- Name
- EPA Establishment No.
- EPA Registration No.
- Concentrate: gals/lbs.
- Mix Rate and Application Rate per Acre

- Herbicide Application Log

In addition to a daily Field Report, a Herbicide Application Log will be filled out. The herbicide log will include, but not be limited to:

- Time
- Mile Post and Location
- Spray Type and Meter Reading
- Remarks: Spray Plan, City, Vegetation, Weather, etc.
- Condition of Vegetation Along ROW

2. Herbicide Application

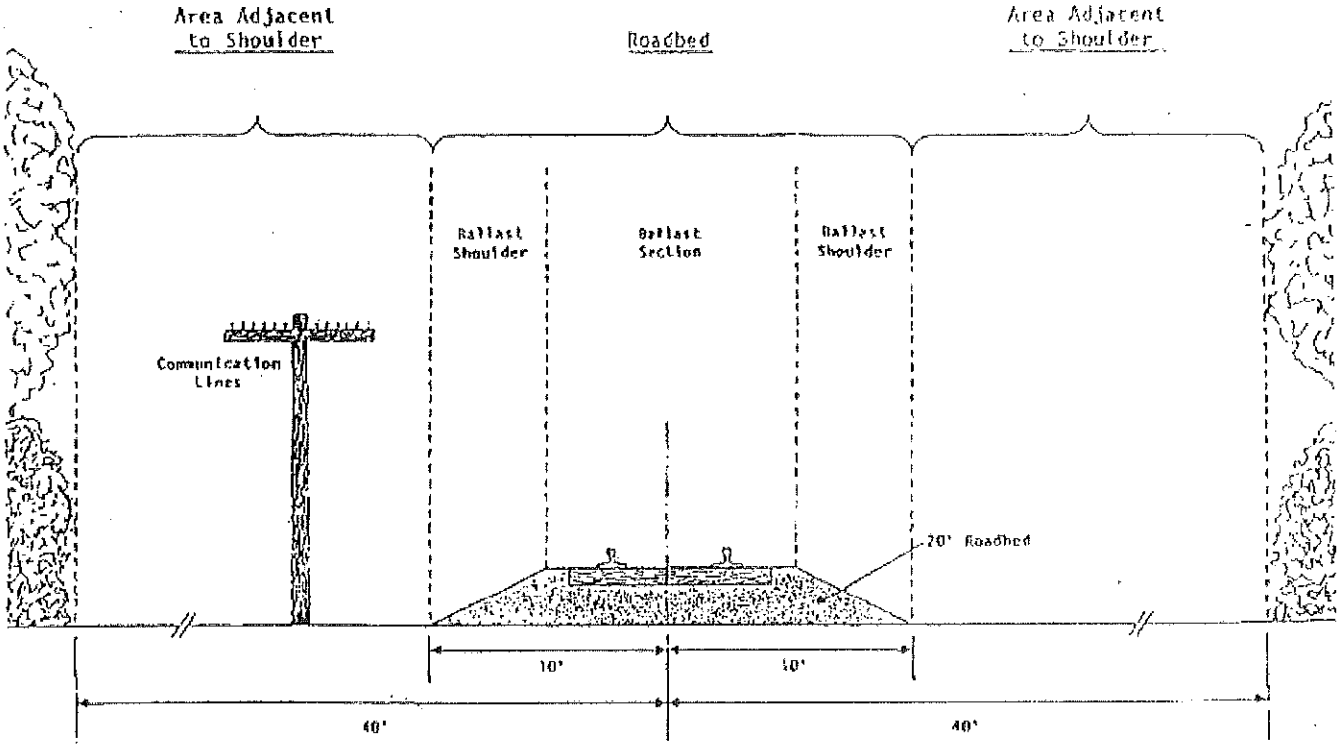
The applicator shall follow label and State regulations on how to handle, mix or load herbicide concentrate on a ROW within a sensitive area. Whenever possible, the applicator will handle, mix or load herbicide while parked on a non-porous surface such as concrete or asphalt.
Water for mixing of herbicide will be obtained from ponds or streams using approved anti-siphon devices.

Appendix A

Railbed Diagram

Figure 1

Railroad Areas Requiring Vegetation Control

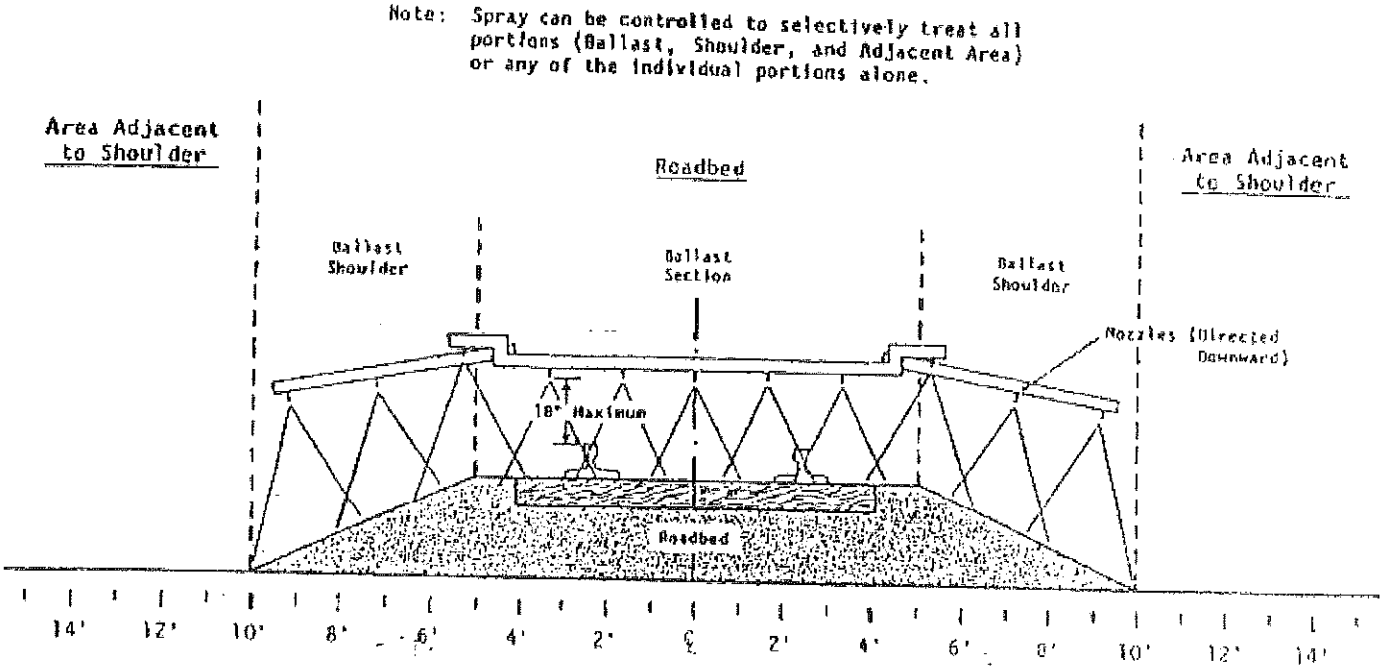


Appendix B

Hi-Rail Spray Truck Diagram

Figure 2

Typical Spray Pattern



TEC ASSOCIATES CONSULTING ENGINEERS

4 February 2019

Mayor Michael Passero
181 State Street
New London, CT 06320

RE: Amtrak 2019 Vegetation Control Program

Dear Mayor Passero:

Enclosed please find the 2019 Vegetation Management Plan (VMP) for the National Railroad Passenger Corporation (Amtrak) in accordance with the requirements of Connecticut General Statutes Section 22a-66a(j). Per the statute this VMP must be submitted to the chief elected official or board of selectmen of each municipality through which Amtrak operates and maintains track. Additionally, this VMP has been submitted to the commissioner of the Connecticut Department of Transportation.

Amtrak is committed to its obligation to maintain its right-of-way in accordance with both state and federal safety standards. Vegetation management is an integral component of those safety efforts.

Please feel free to contact TEC Associates with any questions about this VMP.

Very truly yours,
TEC ASSOCIATES

T.W. Lewis

Thomas W. Lewis

Enclosure

cc: Eric Bergeron, CDOT
Anna Albers, Amtrak

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